Electricity Market Report

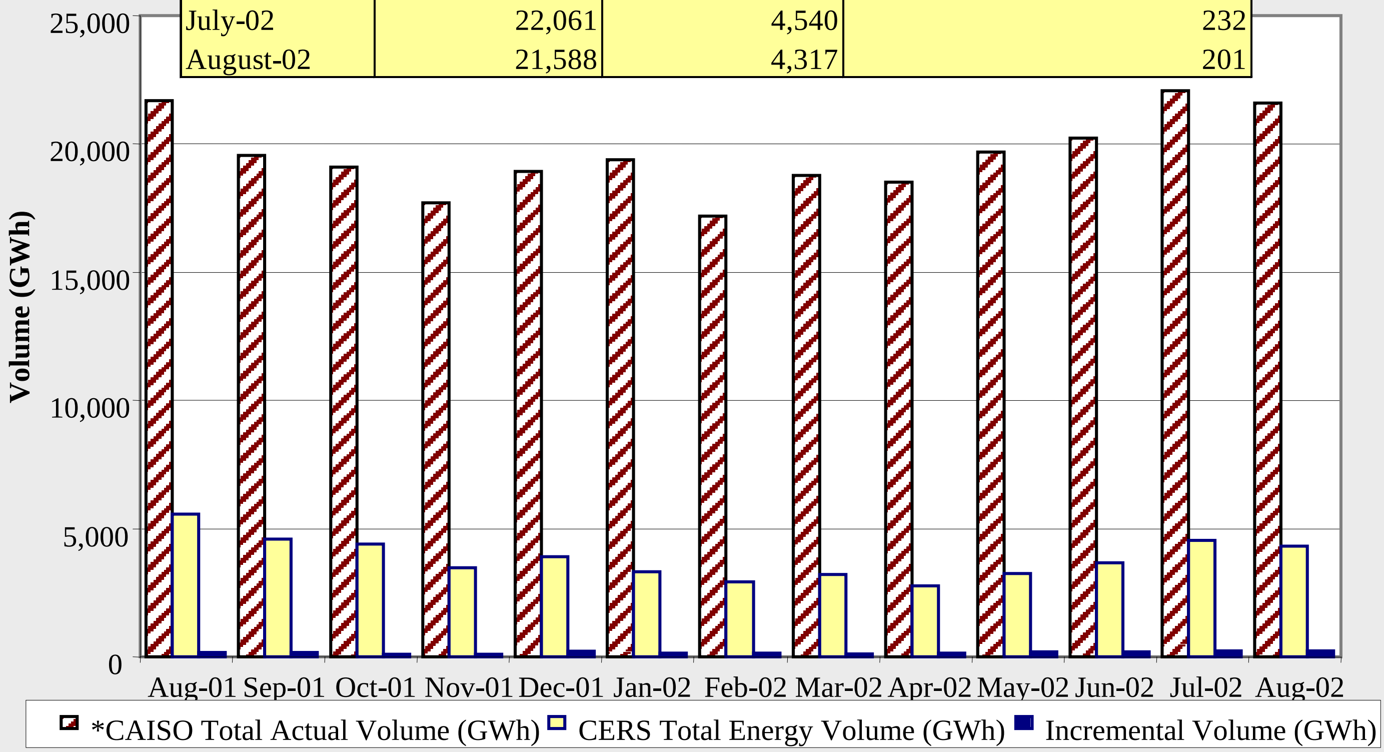
August 2002

Electricity Oversight Board

Market Overview – August 2002

California Energy Market by Total Volume

Period	*CAISO Total Actual Volume (GWh)	CERS Total Energy Volume (GWh)	**CAISO Real-Time BEEP Incremental Volume (GWh)
August-01	21,689	5,580	172
September-01	19,562	4,607	171
October-01	19,105	4,402	104
November-01	17,717	3,471	109
December-01	18,919	3,898	228
January-02	19,386	3,329	158
February-02	17,178	2,933	146
March-02	18,767	3,222	137
April-02	18,517	2,779	150
May-02	19,690	3,262	202
June-02	20,232	3,665	206
July-02	22,061	4,540	232
August-02	21,588	4,317	201



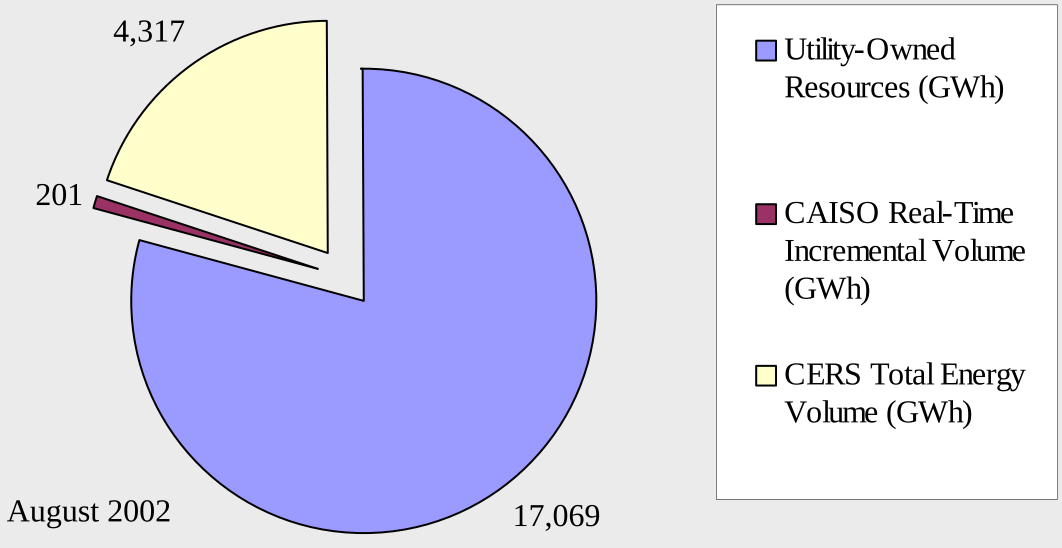
The CAISO actual total volume stayed nearly unchanged from 21,698 GWh in August 2001 to 21,588 GWh in August 2002. The CAISO actual total volume and the CERS total energy volume remained within a 5-percent range from the previous month, while the CAISO real-time BEEP incremental volume dropped by 13 percent.

*CAISO Total Actual Volume: Sum of all energy for the CAISO Control Area, over a period of time.
**Real-Time Market: The competitive generation market controlled and coordinated by the CAISO for arranging real-time imbalance power.

Source: California Independent System Operator. System Load Report August 1, 2002 – July 31, 2002: Online. OASIS. December 10, 2002.
California Independent System Operator. Ex-Post 10-Minute Price Information August 1, 2002 – August 31, 2002: Online. OASIS. September 2002.
California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

Percentage of CAISO Actual Load by Category

Percent of CAISO Total Actual Volume by Category			
Period	CAISO Real-Time Incremental Market	CERS Total Energy Market	Utility-Owned Resources
August-01	0.8%	25.7%	73.5%
September-01	0.9%	23.6%	75.6%
October-01	0.5%	23.0%	76.4%
November-01	0.6%	19.6%	79.8%
December-01	1.2%	20.6%	78.2%
January-02	0.8%	17.2%	82.0%
February-02	0.8%	17.1%	82.1%
March-02	0.7%	17.2%	82.1%
April-02	0.8%	15.0%	84.2%
May-02	1.0%	16.6%	82.4%
June-02	1.0%	18.1%	80.9%
July-02	1.1%	20.6%	78.4%
August-02	0.9%	20.0%	79.1%



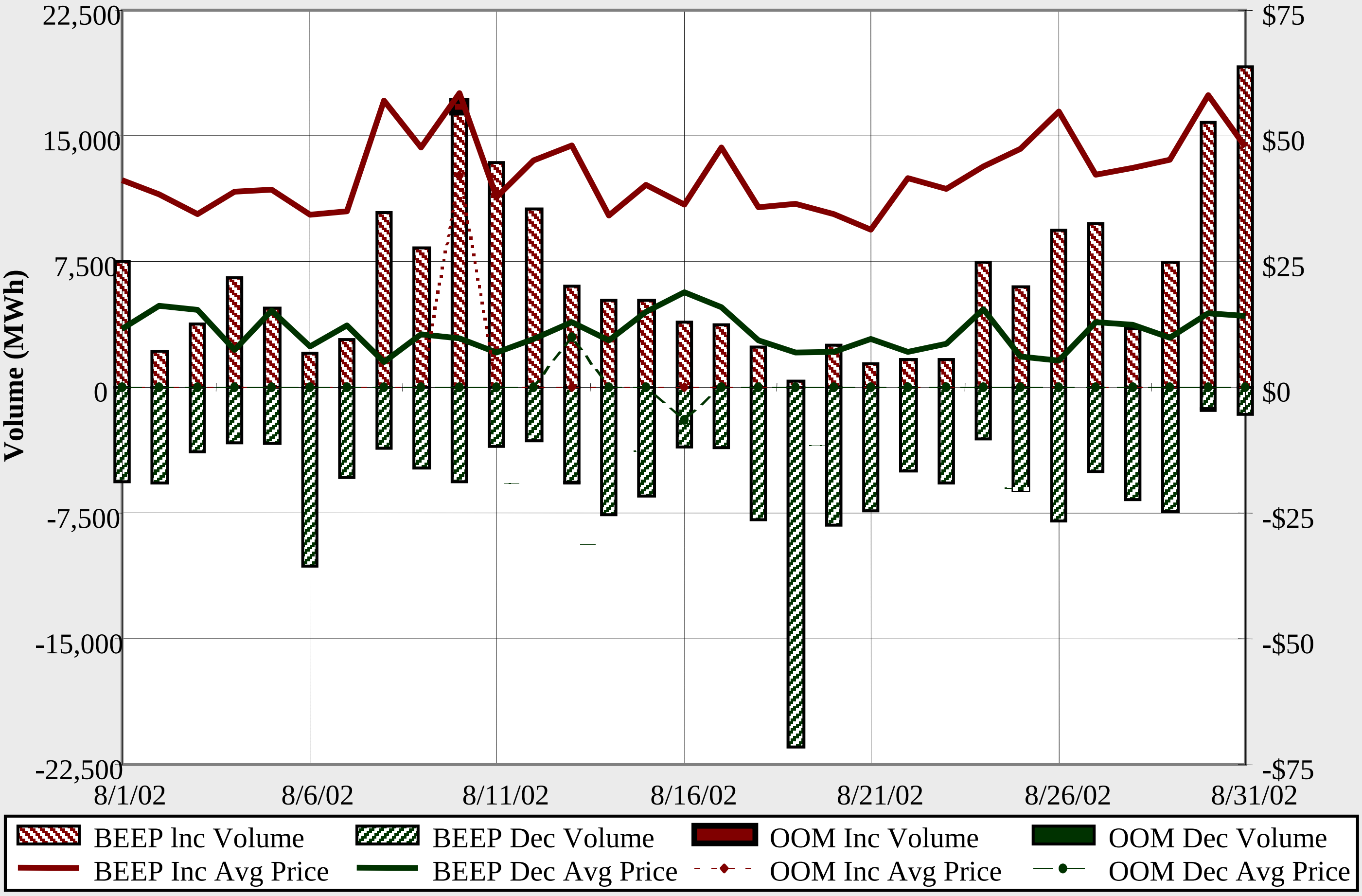
The CAISO real-time incremental volume and CERS total energy market made up roughly 21 percent of the CAISO monthly total actual load in August. The remainder of the total CAISO load is served by utilities that balance load and resources within their service territory.

In August, the utility-owned resources made up 79 percent of the total CAISO load, this figure is up by roughly 6 percent from August 2001.

Source: California Independent System Operator. System Load Report August 1, 2002 – August 31, 2002: Online. OASIS. December 10, 2002.
California Independent System Operator. Ex-Post 10-Minute Price Information August 1, 2002 – August 31, 2002: Online. OASIS. September 2002.
California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

CAISO Real-Time Prices and Volumes for Incremental and Decremental Energy Markets

CAISO Real-Time Energy Market	Real-Time BEEP		Real-Time OOM		Total	
	Inc	Dec	Inc	Dec	Inc	Dec
Volume (MWh)	201,107	180,670	700	143	201,807	180,814
Average Price ($/MWh)	$46.18	-$10.05	$42.00	-$5.26	$46.16	-$10.05



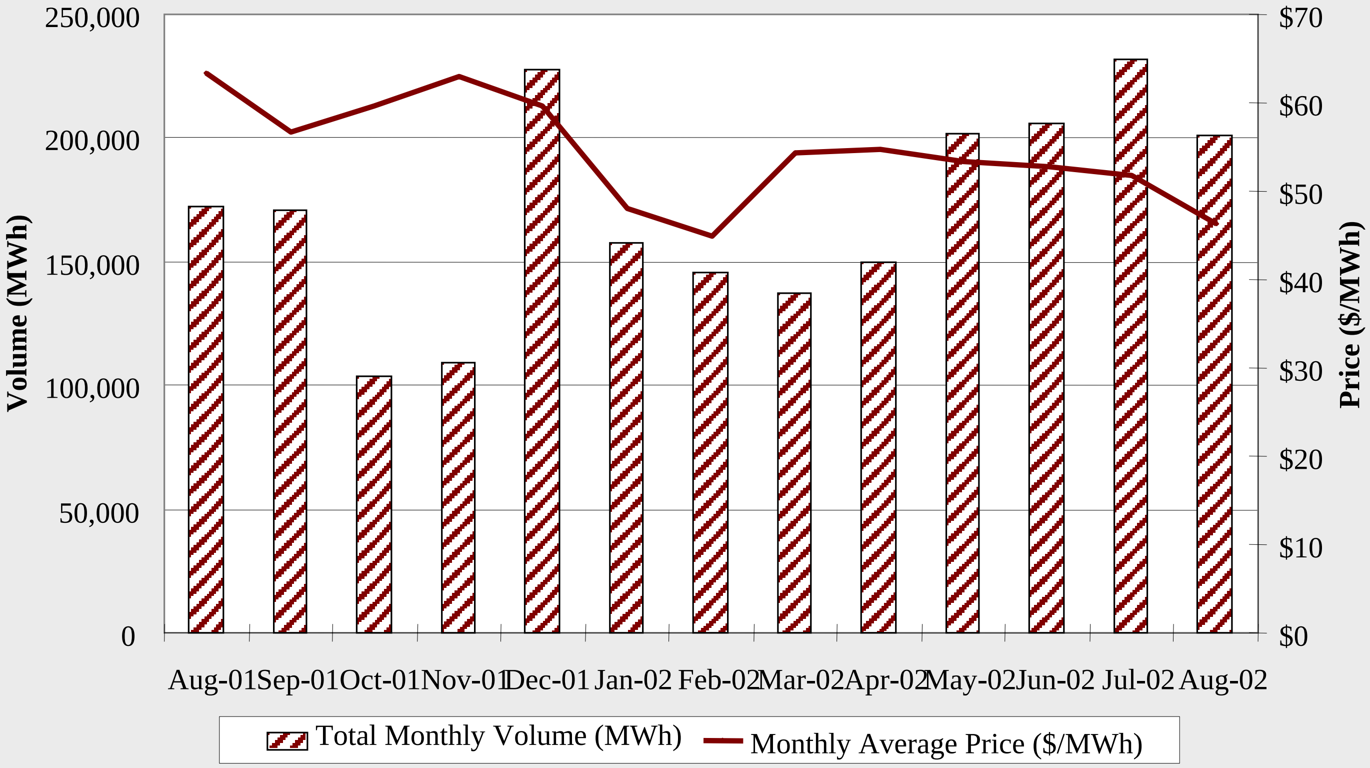
In August, the CAISO real-time BEEP incremental and decremental total volume decreased by over 10 percent from July, while the average prices were mixed with the incremental average price dropping by 11 percent and the decremental average price increasing by 16 percent from July. The CAISO real-time OOM volume dropped significantly over the last month, from 5,192 MWh in July down to 700 MWh in August for the incremental energy market and from 3,941 MWh in July down to 143 MWh in August for the decremental energy market. The average prices in August, experienced price spikes for the period of August 8 through August 12 and August 30 through August 31. This time periods concurred with warmer temperatures across California, increasing gas prices, and high levels of unplanned unit outages.

Source: California Independent System Operator. Ex-Post 10-Minute Price Information August 1, 2002 – August 31, 2002: Online. OASIS. September 2002.

California Independent System Operator. CAISO Data August 1, 2002 – August 31, 2002. September 2002.

CAISO Real-Time BEEP Incremental Market Statistics

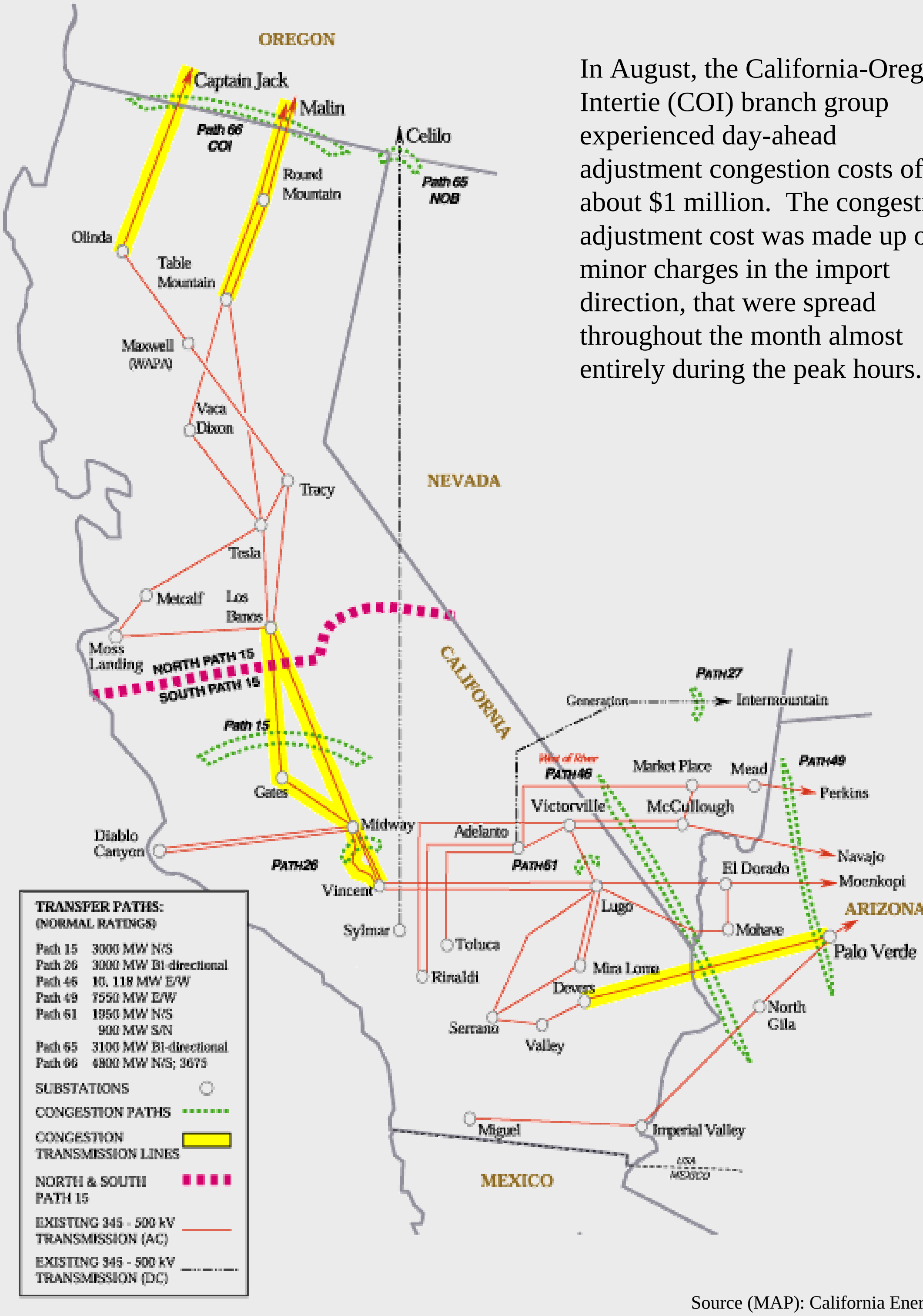
Period	CAISO BEEP Incremental Energy Market	
	Total Monthly Volume (MWh)	Monthly Average Price ($/MWh)
Aug-01	172,470	$63.25
Sep-01	170,879	$56.76
Oct-01	103,759	$59.63
Nov-01	109,068	$62.85
Dec-01	227,744	$59.60
Jan-02	157,526	$47.96
Feb-02	145,874	$44.88
Mar-02	137,121	$54.31
Apr-02	149,967	$54.73
May-02	201,684	$53.28
Jun-02	206,161	$52.78
Jul-02	231,724	$51.79
Aug-02	201,107	$46.18



The CAISO real-time BEEP incremental average price dropped by 11 percent from $51.79/Mwh in July to $46.18/MWh in August. The CAISO real-time BEEP incremental total monthly volume decreased by 13 percent from 231 GWh in July to 201 GWh in August.

Source: California Independent System Operator. Ex-Post 10-Minute Price Information August 1, 2002 – August 31, 2002: Online. OASIS. September 2002.

Selected California Transmission Lines

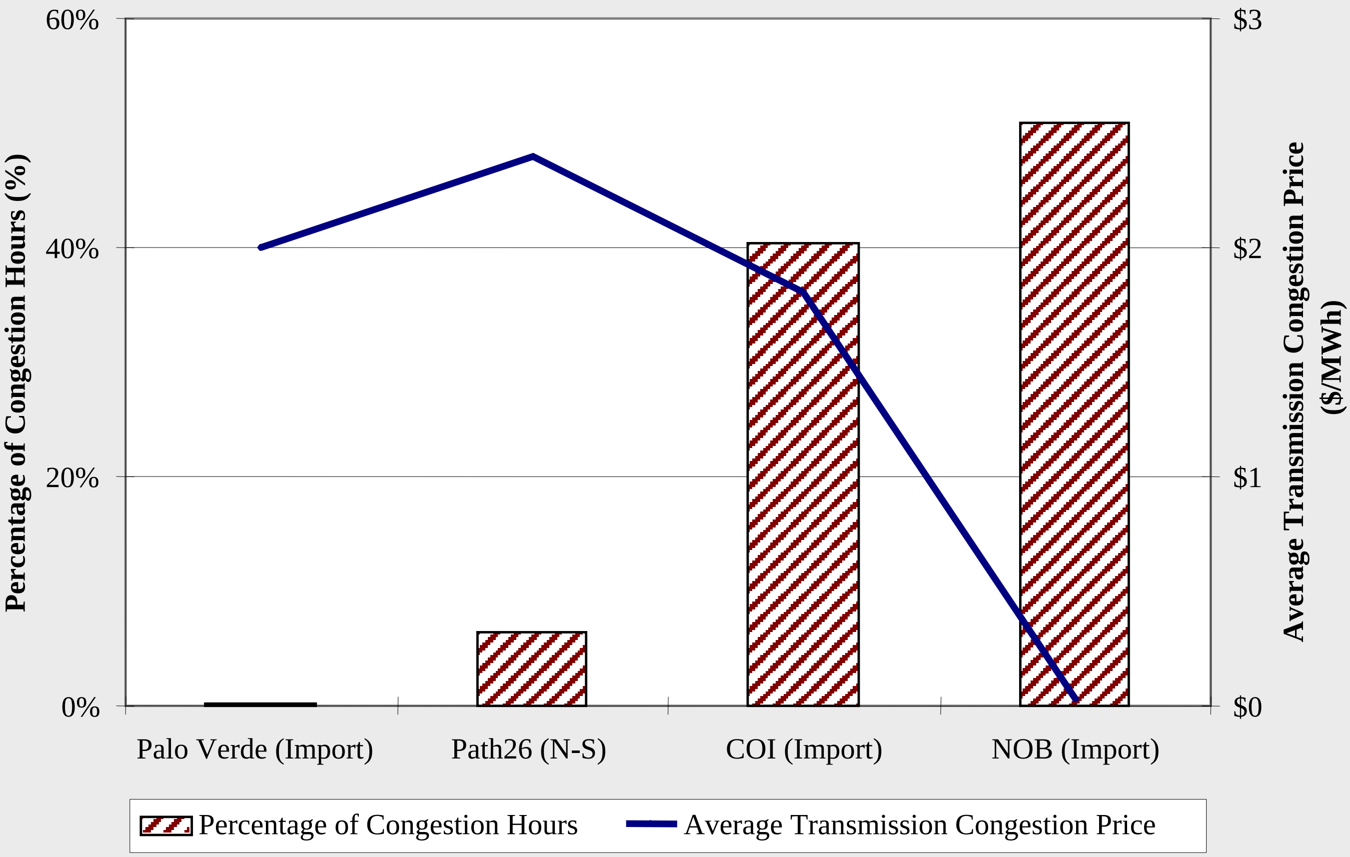


In August, the California-Oregon Intertie (COI) branch group experienced day-ahead adjustment congestion costs of about $1 million. The congestion adjustment cost was made up of minor charges in the import direction, that were spread throughout the month almost entirely during the peak hours.

Source (MAP): California Energy Commission. System Assessment and Facilities Siting Division, Cartography Unit December 2002.

CAISO Congestion Frequency, Prices, and Cost

Branch Group	Number of Hours of Congestion	Percentage of Congestion Hours	Average Transmission Congestion Price ($/MWh)	Day-Ahead Adjustment Congestion Cost ($)
Palo Verde (Import)	2	0.3%	$2.00	$6,300
Path26 (N-S)	48	6.5%	$2.40	$279,726
COI (Import)	300	40.3%	$1.80	$1,052,673
NOB (Import)	366	50.8%	$0.03	$20,733
Total				$1,359,432



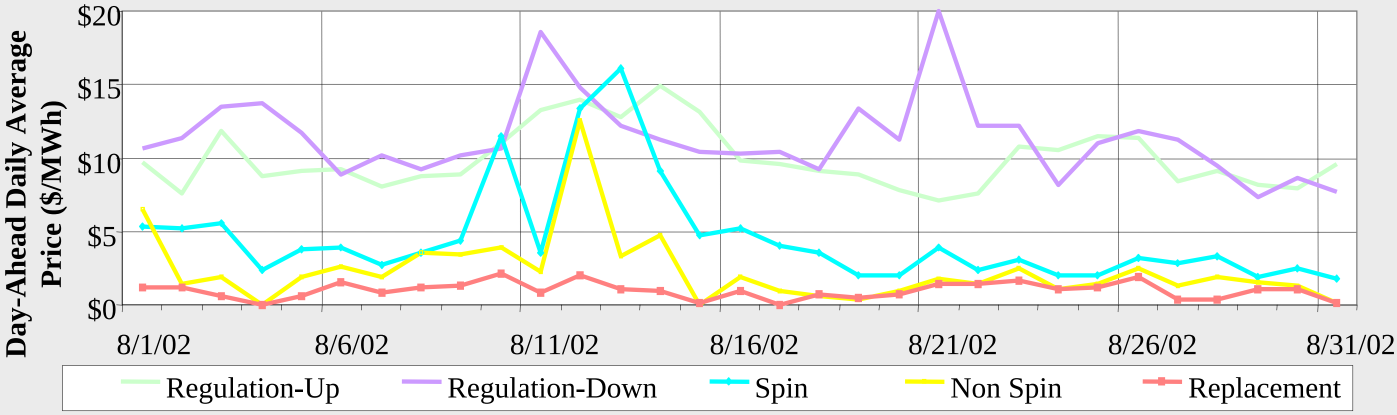
The day-ahead adjustment congestion cost dropped sharply in August from July for nearly all major branch groups which are frequently subject to congestion costs. In August, the COI branch group incurred the greatest day-ahead adjustment congestion cost at about $1 million, followed by Path 26 at roughly $280,000. The day-ahead adjustment congestions cost in August totaled less than $1.4 million.

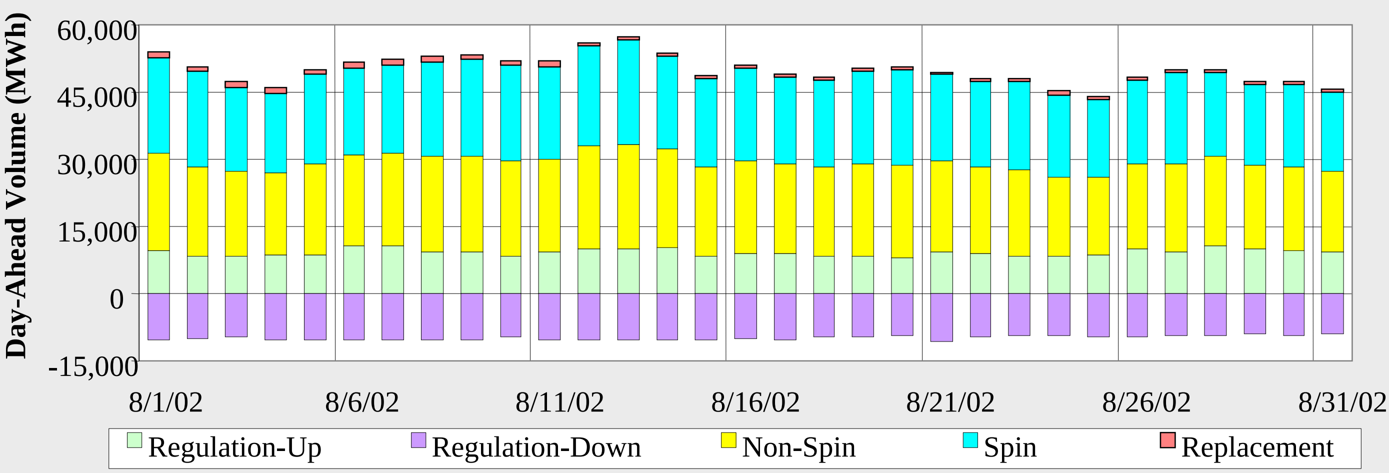
Source: California Independent System Operator. Branch Group Congestion Market Summary August 1, 2002 – August 31, 2002: Online. OASIS. December 10, 2002.

California Independent System Operator. Actual Scheduled Flow August 1, 2002 – August 31, 2002: Online. OASIS. December 10, 2002.

Ancillary Services Statistics

August 2002 Ancillary Services Market Segment	Average Price ($/MWh) Day-Ahead	Hour-Ahead	Total	Average Hourly MW Day-Ahead	Hour-Ahead	Total	Percent Purchased in Day-Ahead	Percent Share of Total A/S Market
Regulation Up	$10.33	$9.40	$10.27	384	23	407	94%	16%
Regulation Down	$11.70	$9.02	$11.48	413	25	437	94%	17%
Spin	$5.07	$4.04	$5.02	826	25	851	97%	33%
Non-Spin	$2.77	$2.92	$2.78	837	22	859	97%	33%
Replacement	$1.02	$1.00	$1.02	36	3	39	92%	2%
Total				2,497	98	2,595	96%	100%





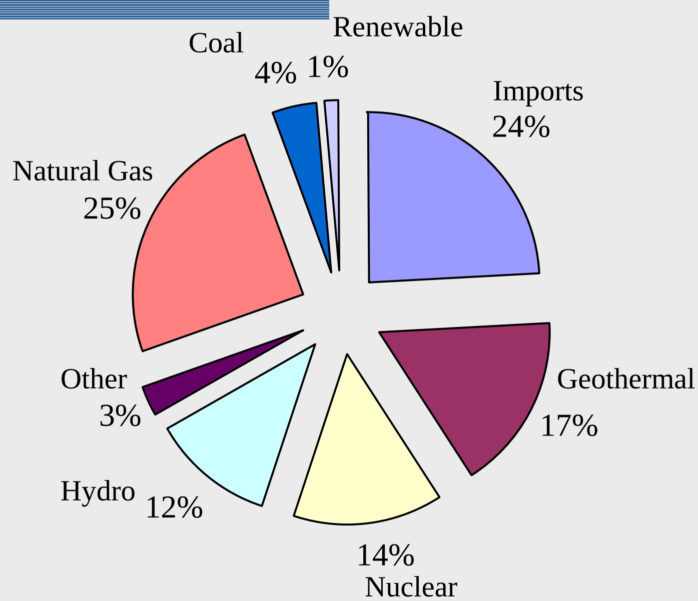
The weighted average price for the total ancillary services market segments dropped sharply by 43 percent at $6.13/MWh in August from $10.76/MWh in July. The total hourly average load decreased by 5 percent at 2,595 MW in August, down from July at 2,742 MW.

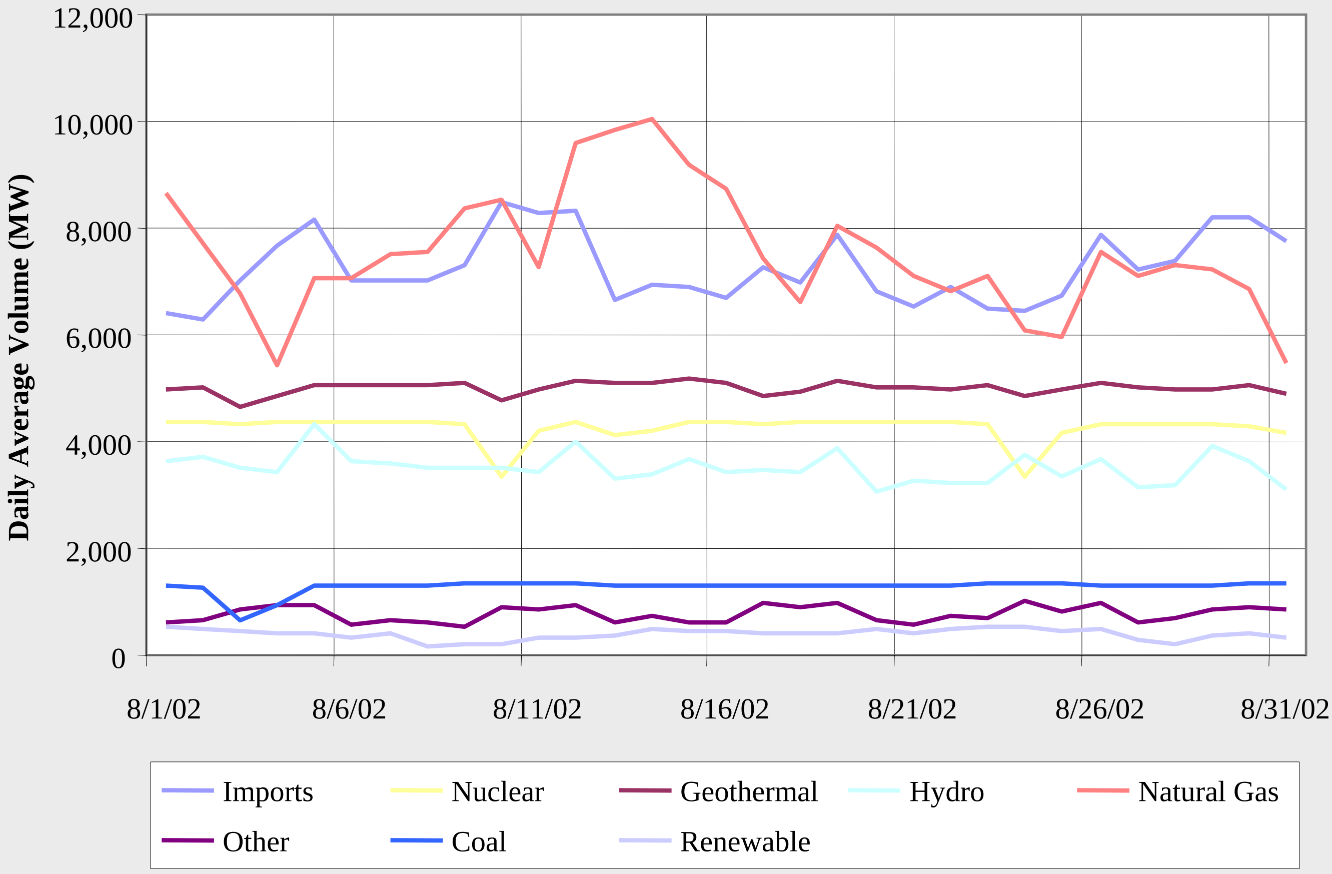
In August, the day-ahead daily average prices were stable, with the highest peak price at about $20/MWh for regulation-down market segment.

Source: California Independent System Operator. CAISO Data August 1, 2002 – August 31, 2002. September 2002.

CAISO Day-Ahead Resource Mix

August 2002 Resource Mix	**Day-Ahead Market** Monthly Total Volume (MW)	Percent Share of Total
Natural Gas	5,607	25.1%
Imports	5,397	24.2%
Geothermal	3,724	16.7%
Nuclear	3,162	14.2%
Hydro	2,613	11.7%
Coal	949	4.3%
Other	573	2.6%
Renewables	291	1.3%





In August, the generation supply remained moderately stable. The monthly total volume for all generation resources were fairly similar to volumes observed last month, with the exception of the natural gas-fueled supply that was down by roughly 9 percent from July .

Source: California Independent System Operator. CAISO Data August 1, 2002 – August 31, 2002. July 2002.

CERS Average Daily Cost and Total Expenditures

Redacted from Public Version Due to Confidential Data

In August, the daily average cost for the CERS total energy market increased by 3 percent from July, however the monthly total expenditure was down slightly due to lower total energy volume in August.

Warmer weather conditions across California resulted in increased load from August 7 that continued through August 16. The gradual decrease in the daily average price for this period was due to the purchase of energy in the CERS spot market (day-ahead, hour-ahead, and out-of-market) at a lower cost than the forward market (contract and balance of the month and quarterly), which resulted in a total lower average price. The price dips in the graph coincide with Sundays, which is typically associated with lower load and price.

*CERS Total Energy Market includes: CERS spot (out of market, hour-ahead, and day-ahead) and forward (contracts, balance of month and quarterly) market purchases.

Source: California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Dept. of Water Resources 2002.

CERS Volume Purchased by Market Segment

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In August, the CERS contract and balance-of-the-month and quarterly remained nearly unchanged from July. However, the CERS day-ahead, hour-ahead and out-of-market net transactions favored sales.

On August 22, the CERS daily average price spiked at above $150/MWh. This price spike was due to sales volume in the spot market off-setting purchases volume in the forward market, thus resulting in a lower total daily volume. The reduced total daily volume divided into the total daily expenditure resulted in a price spike.

Source: California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

CERS Forward Market Statistics

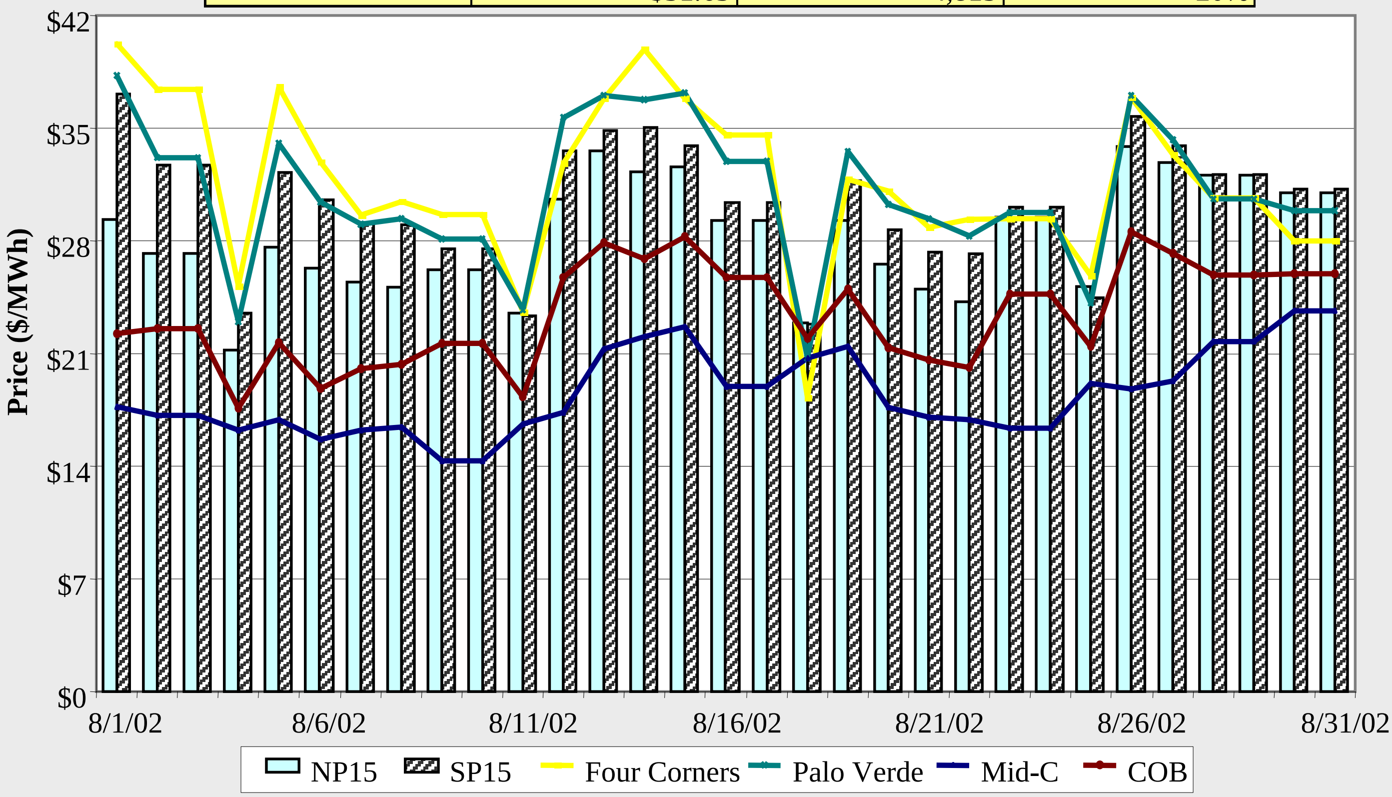
Redacted from Public Version Due to Confidential Data

In August, the monthly average prices and volume for the CERS forward market remained nearly unchanged from the previous month.

Source: California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

Electric Indices On-Peak Daily Average Prices

August 2002 Regional Hubs	On-Peak Average Price ($/MWh)	On-Peak Total Volume (MW)	Percent Difference from Prior Month
NP15	$28.31	42,000	-18%
SP15	$30.38	32,175	-17%
COB	$23.45	21,250	11%
Mid-C	$18.53	49,350	71%
Palo Verde	$30.99	34,700	-19%
Four Corners	$31.63	4,815	-20%



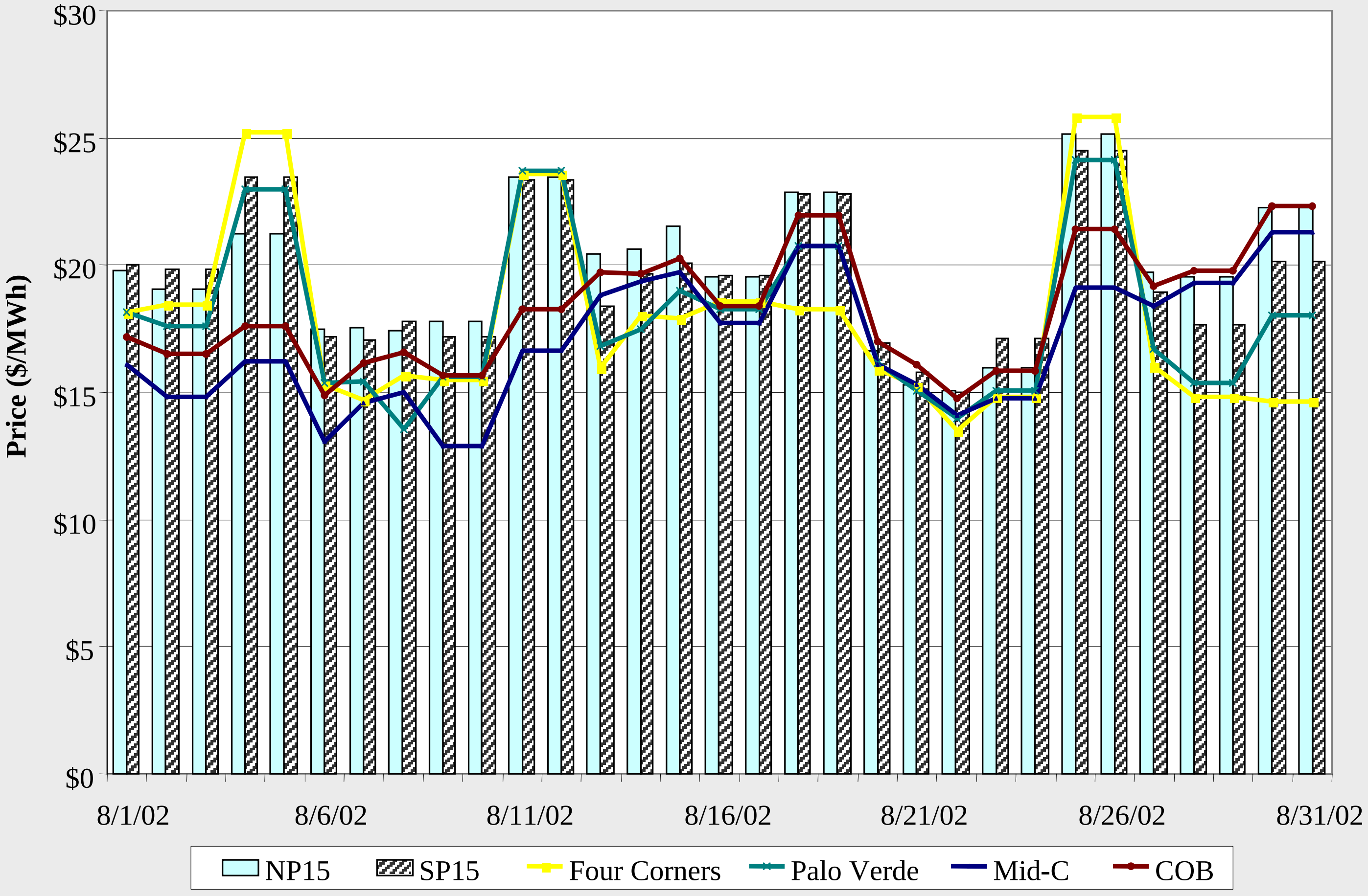
In August, the change in the average daily prices for the regional hubs were mixed from July. The daily average prices for the California and southwestern regions experienced a drop in prices by roughly 20 percent. The average prices for the northwest region experienced an increase, particularly at Mid-C by 71 percent, followed by COB at 11 percent.

The daily average prices were stable throughout August with somewhat higher prices occurring for dates that concurred with warmer weather conditions. The northwest hubs, COB and Mid-C, incurred higher prices due to lower hydro electric generation than was available for the previous months.

Source: Energyonline. Dow Jones Electricity Indices. August 1, 2002 – August 31, 2002: Online. Energyonline. September 2002.

Electric Indices Off-Peak Daily Average Prices

August 2002 Regional Hubs	Off-Peak Average Price ($/MWh)	Off-Peak Total Volume (MW)	Percent Difference from Prior Month
NP15	$19.85	35,725	16%
SP15	$19.61	23,875	20%
COB	$18.29	18,125	61%
Mid-C	$17.02	35,700	112%
Palo Verde	$18.08	21,725	15%
Four Corners	$17.92	5,845	17%



In August, the daily average prices increased from 15 percent to 20 percent for California and southwest regional hubs and increased sharply for Mid-C by 112 percent followed by COB at 61 percent, over July. The daily average prices for the off-peak period converged in August.

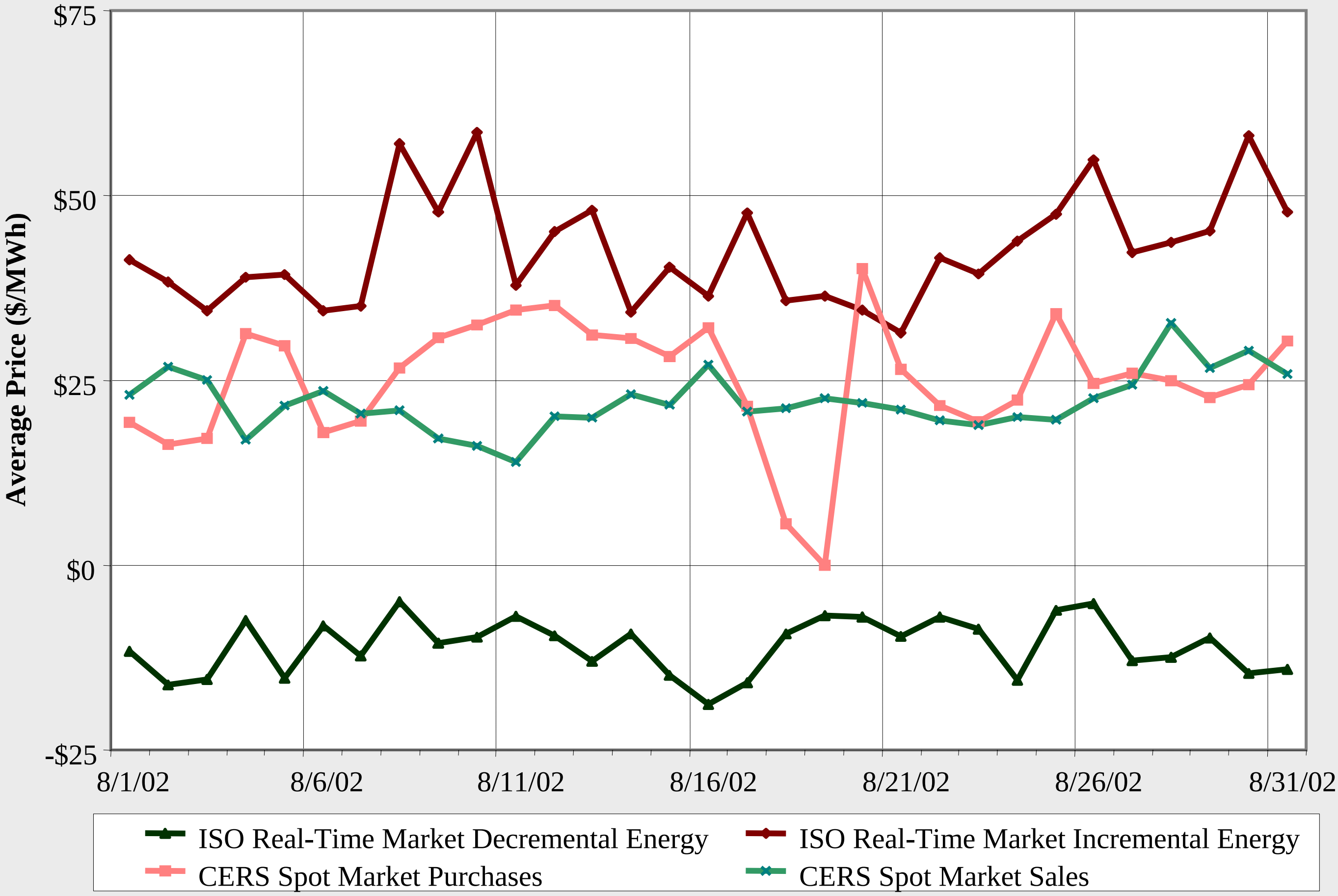
The total volume increased for NP15 by 40 percent, followed by Palo Verde by 26 percent from July. The volume for all other remaining hubs stayed nearly the same.

Source: Energyonline. Dow Jones Electricity Indices. August 1, 2002 – August 31, 2002: Online. Energyonline. September 2002.

Daily Average Prices for CERS Spot Energy vs. CAISO BEEP Energy Market

August 2002 CERS SPOT Market	Purchases Volume (MWh)	Purchases Average Cost ($/MWh)	Sales Volume (MWh)	Sales Average Cost ($/MWh)
Out of Market	0.3	$24.08	0.0	$0.00
Hour-Ahead	129.3	$25.67	131.6	$21.24
Day-Ahead	203.0	$36.44	348.7	$22.89
Total	332.6	$32.24	480.3	$22.43

CAISO Real-Time Energy Market	Incremental Volume (MWh)	Incremental Average Cost ($/MWh)	Decremental Volume (MWh)	Decremental Average Cost ($/MWh)
BEEP	201,107	$46.18	180,670	-$10.05



The average price for the CERS day-ahead purchase dropped to $0/MWh on August 19, since there was no purchase on the spot market for this date.

Source: California Independent System Operator. Ex Post 10-Minute Price Information August 1, 2002 – August 31, 2002: Online.OASIS. September 2002.
California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

CERS Forward Market vs. Spot Index*

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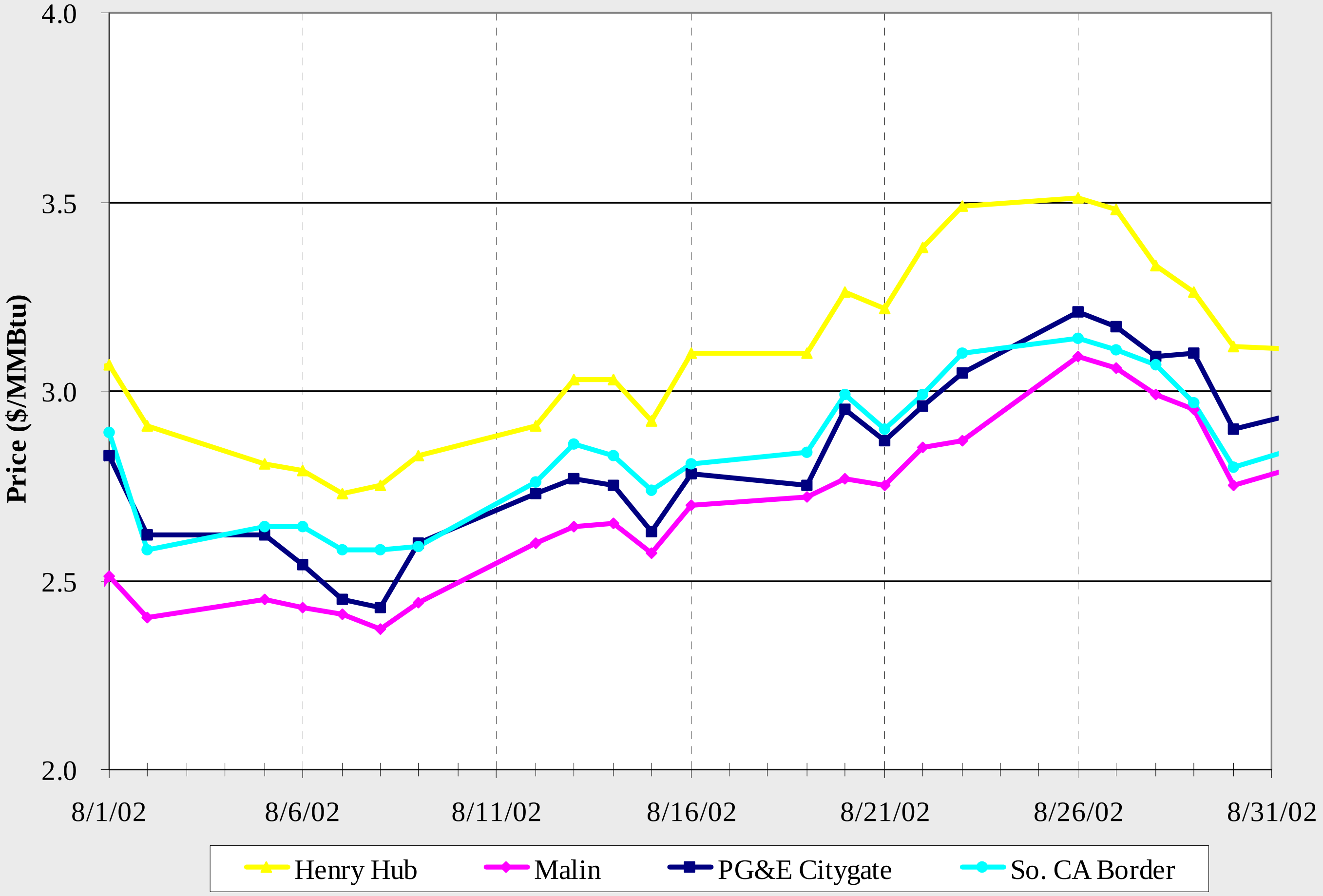
In August, the daily average prices remained stable for CERS and Dow Jones markets.

*Note: Weighted average prices at major hubs including NP15, SP15, COB, PV, Mid-C, and Four Corners.

Source: Energyonline. Dow Jones Electricity Indices. August 1, 2002 – August 31, 2002: Online. Energyonline. September 2002.
California Department of Water Resources. CERS Detailed Purchase Power Report. Sacramento: California Department of Water Resources 2002.

Natural Gas Prices

August 2002	Malin	PG&E Citygate	So. CA Border	Henry Hub
Monthly Average Prices ($/MMBtu)	$2.68	$2.81	$2.84	$3.09



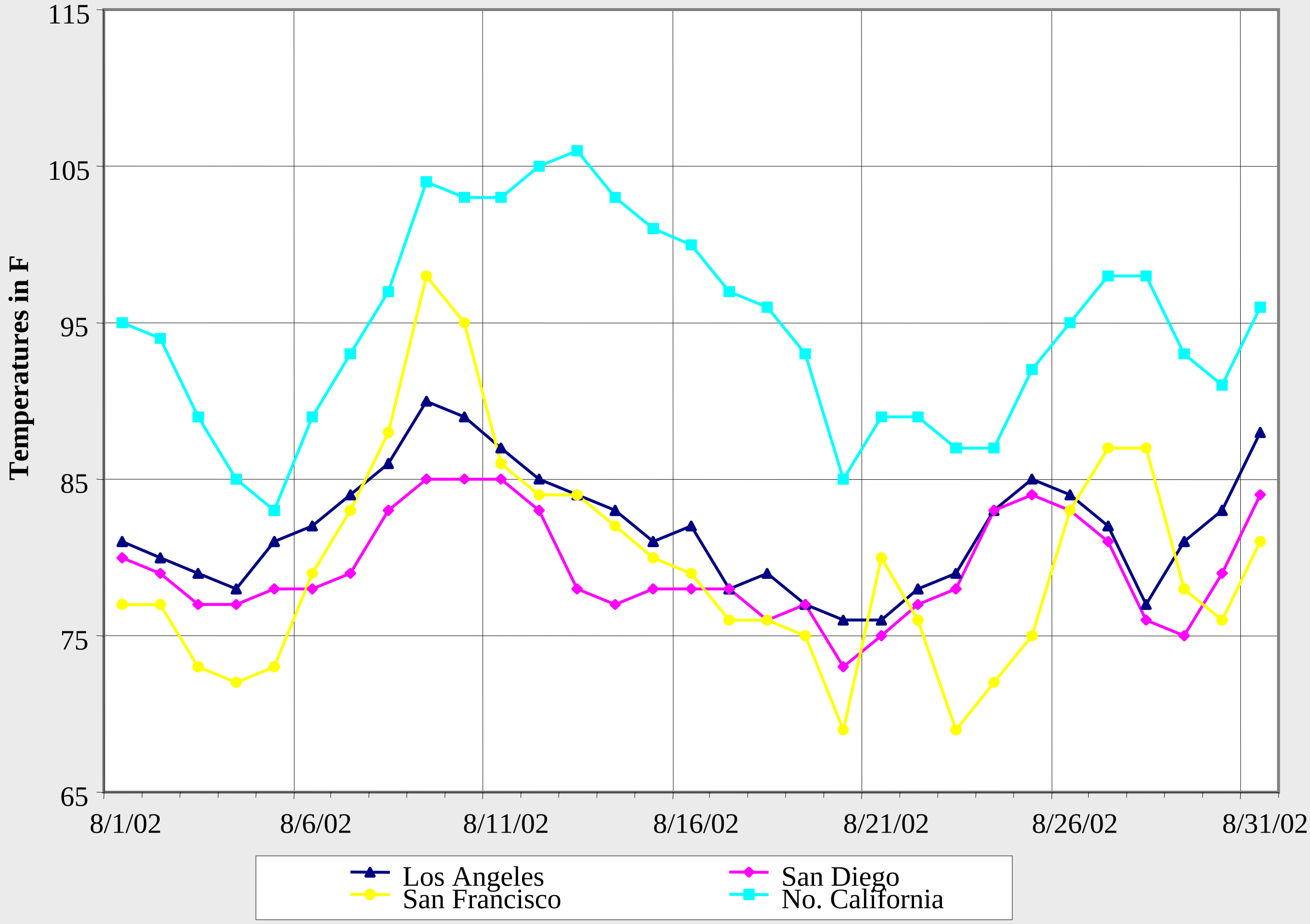
In August, the natural gas monthly average price followed a similar curve for all the natural gas hubs, with the average prices remaining at close range for western hubs (Malin, PG&E CityGate, and So. CA Border). The gap between Malin and the remaining natural gas hubs drew closer in August, as the northwest hydroelectric supply tapered off requiring gas fired resources to come on line. The average natural gas price increased for Malin by 17 percent from July.

With warmer weather conditions across California and southwest, the average prices began to increase gradually throughout the month. On August 26, the average prices began to drop, mainly as a result of maintenance restricting the flow of natural gas in the northwest pipelines, which lead to ample surplus.

Source: "Spot Gas Prices." August 1, 2002 – August 31, 2002. Power Market Today. Online. Natural Gas Intelligence Online. December 12, 2002.

Temperatures Across California

August 2002	Los Angeles	San Diego	San Francisco	No. California
Average Daily Temperature (°F)	81.9	79.3	79.7	94.7



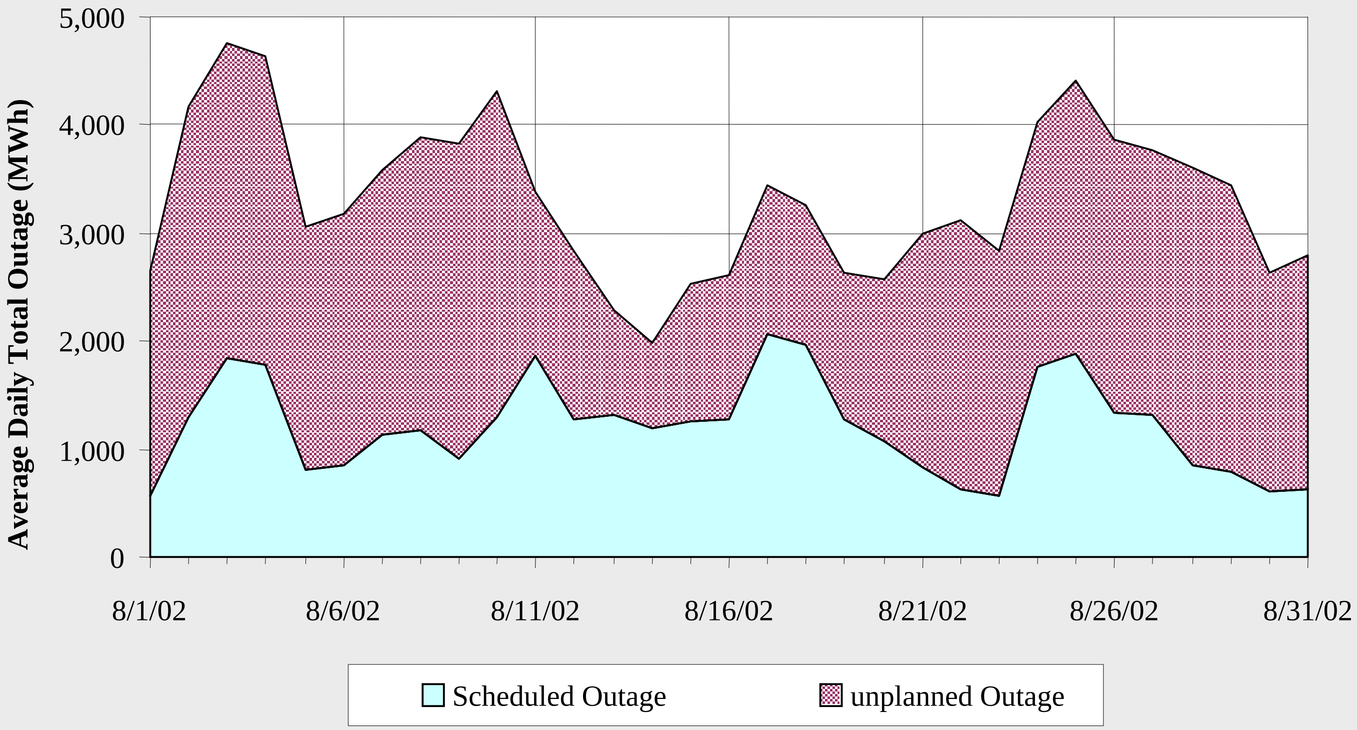
Temperature across California experienced a heat wave from August 6 through August 17, particularly in Northern California, which remained considerably higher than the other locations throughout the month of August.

Source: California Independent System Operator. Grid Operation Actual and Forecast Data August 1, 2002 – August 31, 2002. December 2002.

Unit Outage

August 2002 Daily Constrained Generation	**Scheduled Outage** (MW)	**Unplanned Outage** (MW)
Average	1,248	2,187
Maximum	2,073	3,031
Minimum	566	790

Top 5 Generators with Scheduled outage		**Top 5 Generators subjected to Unplanned outage**	
Unit Name	Constrained Capacity (MW)	Unit Name	Constrained Capacity (MW)
Huntington Beach Unit 5	88	Four Corners	434
Hyatt/Thermalito Complex	86	Alamitos Unit 6	268
Alamitos Unit 6	85	Delta	221
Ormond Beach Unit 1	67	Moss Landing Unit 2	137
Diablo Canyon Unit 1	66	Mohave Unit 1	92



In August, the daily average scheduled and unplanned outages increased over the past month by 11 percent and 7 percent, respectively. The average daily total for unplanned outage reached roughly 3,000 MWh for the first and last week in August coinciding with warmer weather conditions in California.

*Scheduled Outage: generating units not in operation due to planned maintenance, scheduled closures, refueling, or other planned occurrences.
**Unplanned Outage: generating units not in operation due to breakdowns, storms, or other unplanned occurrences.

Source: California Independent System Operator. CAISO Data August 1, 2002 – August 31, 2002. September 2002.